A new approach to the design of decentralised controllers, using Multi-Objective Evolutionary Algorithm (MOEA), for load-frequency control of interconnected power systems with AC-DC parallel tie-lines and considering Governor Dead Band and Generation Rate Constraint nonlinearities, is proposed in this paper. The HVDC link is used as system interconnection in parallel with AC tie-line to effectively damp the frequency oscillations of AC system. The proposed controller satisfies two main objectives, namely, minimum Integral Squared Error of the system output and maximum closed loop stability of the system.

Simulation studies are conducted on a two area interconnected power system with AC-DC parallel tie lines and considering nonlinearities. Results indicate that the proposed controller gives good dynamic responses and can guarantee the stability of the overall system in the presence of system nonlinearities and parameter changes.

Reference


Index Terms

Power Engineering
Control Systems

Key words

Power systems
Load-frequency control
Multi-Objective Evolutionary Algorithm

HVDC link

AC-DC tie-lines

Governor dead band

Generation rate constraint